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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/035,804 | 12/28/2001 | Jack R. Kelly | COAD-003/01US | 1747 |
| 23419 | 7590 | 10/09/2003 | EXAMINER DUONG, TAI V | |
| COOLEY GODWARD, LLP 3000 EL CAMINO REAL 5 PALO ALTO SQUARE PALO ALTO, CA 94306 | | | ART UNIT 2871 | PAPER NUMBER |

DATE MAILED: 10/09/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/035,804

Applicant(s)

KELLY ET AL.

Examiner

Tai Duong

Art Unit

2871

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-24 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-17 and 20-24 is/are rejected.
- 7) ☐ Claim(s) 18 and 19 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4.
- 4) ☐ Interview Summary (PTO-413) Paper No(s) ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

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The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1, 2, 9-11, 14, 16, 17, 20, 23 and 24 are rejected under 35 U.S.C. 102(e) as being anticipated by Buhrer et al.

Note Figs. 3a and 5a which identically disclose the claimed achromatic half wave plate and the method for achromatic electro-optical modulation comprising applying a linearly polarized incident beam (49) to an input surface of a first twisted nematic liquid crystal (TNLC) layer 50 and processing said linearly polarized incident beam through a uniaxial half wave plate 61 and a second TNLC layer 51 to produce a substantially orthogonally polarized beam at an output surface of said second TNLC layer (col. 10, lines 53-59). For the remainder of the claims, see column 8, lines 43-63; col. 10, lines 38-67; col. 11, lines 3-35.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 4-8, 12, 15, 21 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Buhrer et al in view of Liu et al, Sharp and Sharp et al.

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As to claims 4-8, it is well-known in the art to employ polymer LC films for flexibility. It also well-known in the art to employ crystalline birefringent material as passive (fixed) retarder, and nematic liquid crystal, smectic A liquid crystal, smectic C liquid crystal as active half wave plate with variable retardance, as evidenced by Buhrer et al, Liu et al, Sharp and Sharp et al of record.

As to claims 12 and 21, it would have been obvious to a person of ordinary skill in the art to provide approximately 30 db or more isolation between two polarization states over a wavelength range of $\pm 20\%$ of a central wavelength for obtaining an optical polarizing switch with high contrast, as evidenced by Liu et al (col. 5, lines 7-13).

As to claims 15 and 22, it would have been obvious that Buhrer's device also produces substantially uniform output polarization over at least a 50°C temperature range over a wavelength range of $\pm 2\%$ of a central wavelength due to the operating temperature range of the common liquid crystal cells over at least a 50°C temperature range, as is well-known in the art.

Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Buhrer et al in view of Plach et al and Van De Witte et al.

Plach et al disclose that it was known to employ LC cells having twist angles between 80° and 170° (col. 3, lines 46-50). Van De Witte et al disclose that it was known to employ LC cells with twist angle of approximately 135° (col. 5, line 9, claim 3). Thus, it would have been obvious to a person of ordinary skill in the art to employ TNLC cells with twist angle of approximately 135° for obtaining a polarization switch with large operating range, as compared to 90° twist LC cells.

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Claims 18 and 19 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claims 18 and 19 would be allowable over the prior art of record because none of the prior art discloses or suggests an achromatic half wave plate comprising an uniaxial half wave plate between the first and second twisted nematic liquid crystal layers wherein the optic axis at the entrance of the uniaxial half wave plate makes an angle of 45 degrees to the polarization of the incident beam and wherein the incident is linearly polarized and an angle of 90 degrees to the optic axis at the exit of the first twisted nematic liquid layer.

Any inquiry concerning this communication should be directed to Tai Duong at telephone number 703 308-4873.

TVD

10/03


T. Chowdhury
Primary Examiner